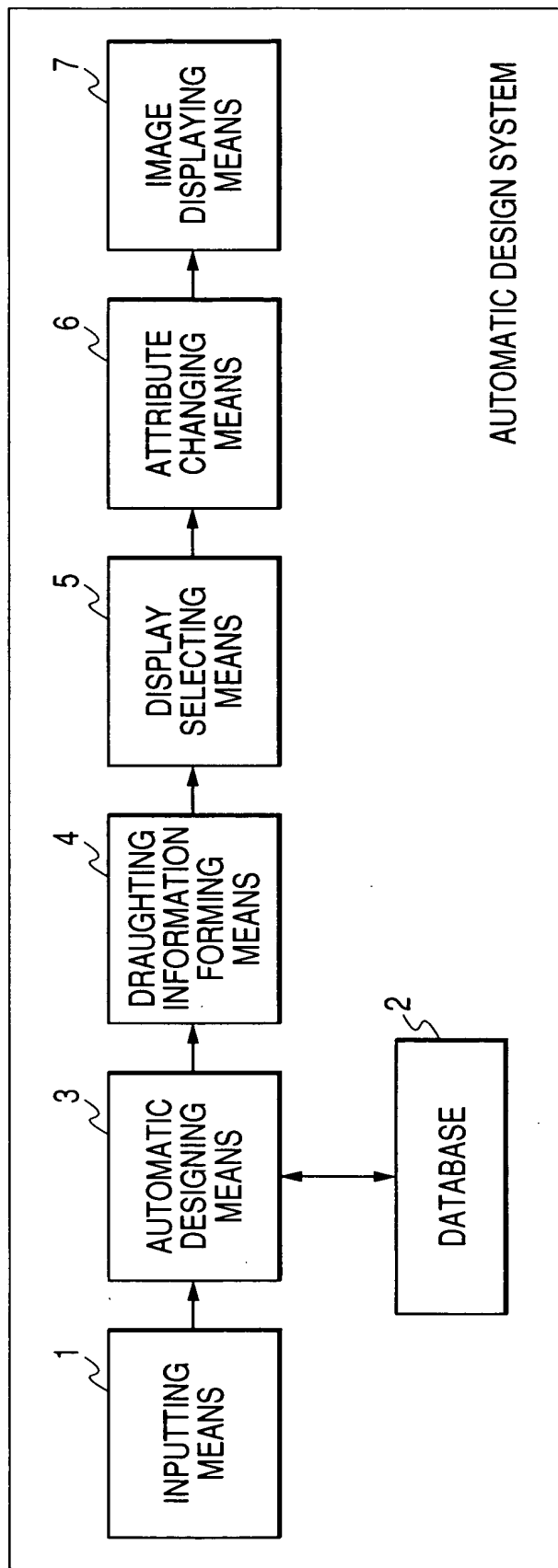




FIG. 1



2 / 27

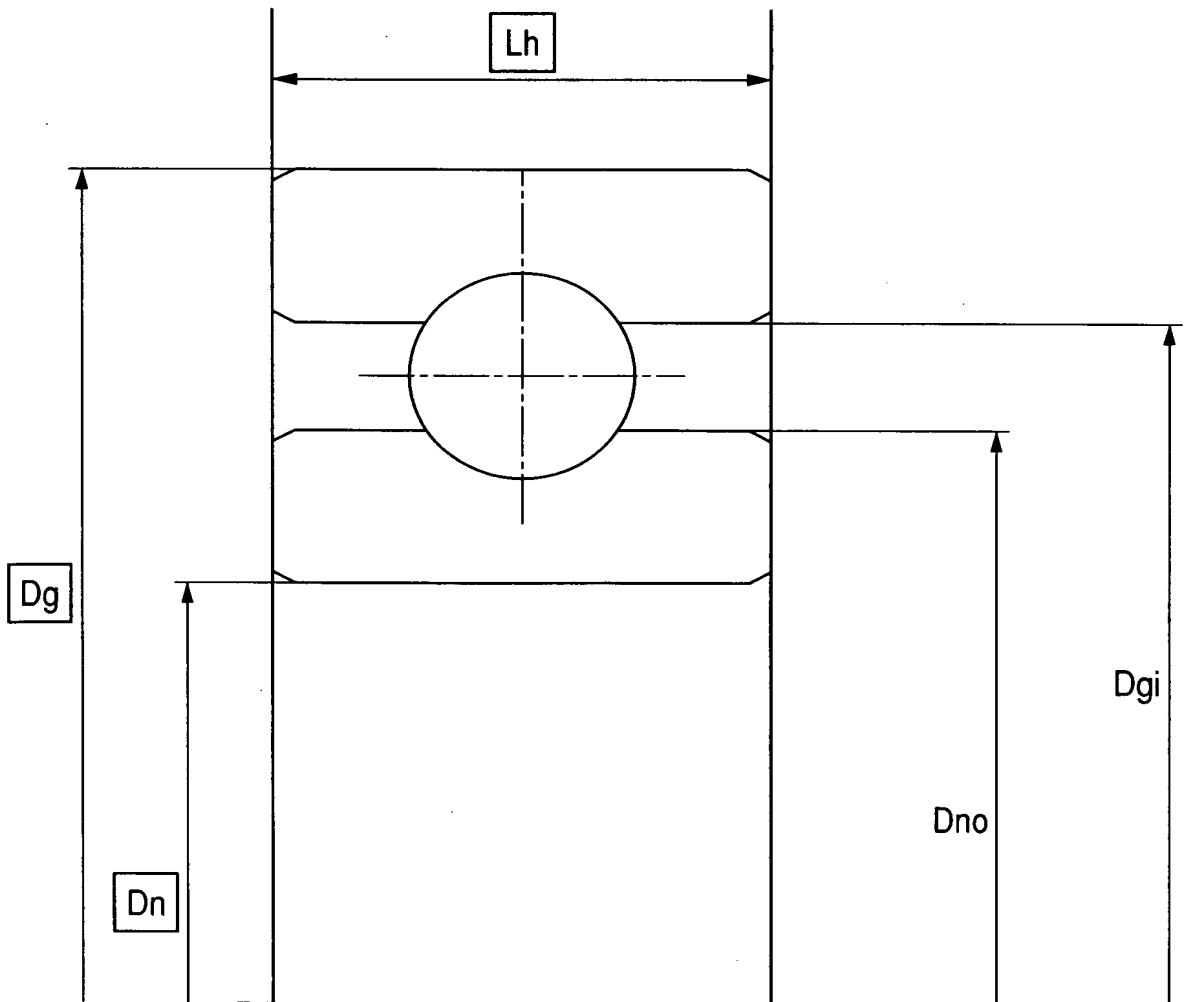
**FIG. 2**

	Dno	r1
	10 ~ 30	0.2
	30 ~ 50	0.3
	50 ~ 100	0.5

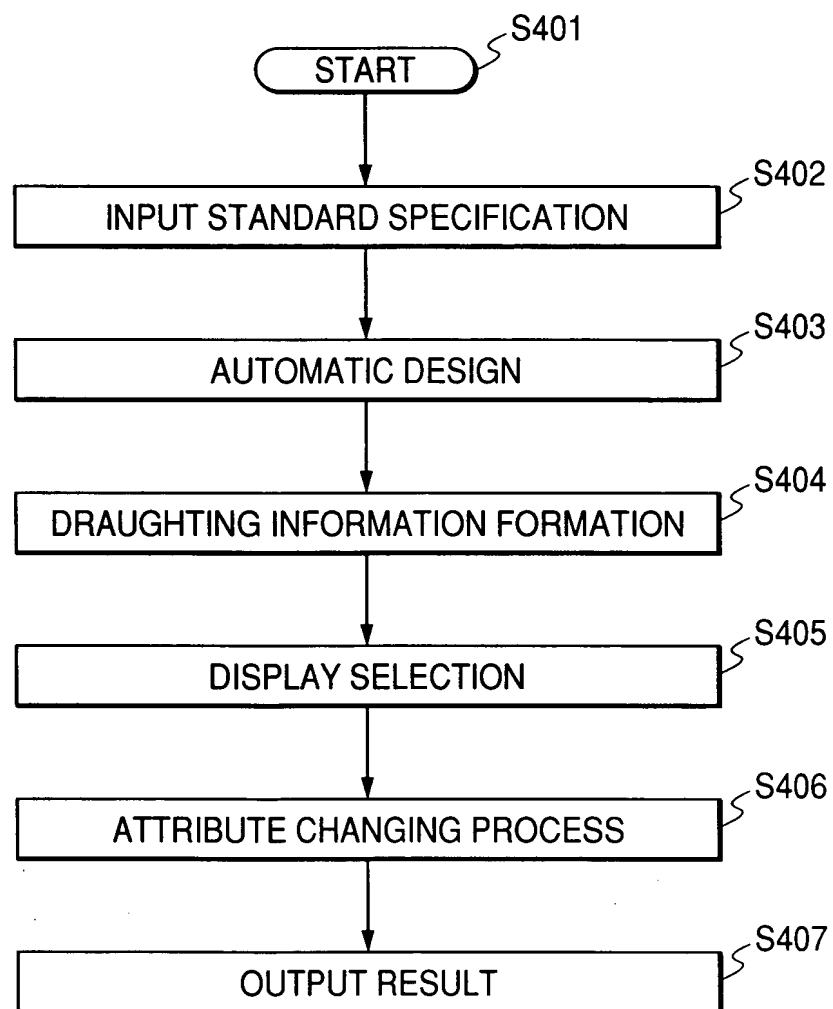
  

	Dgi	r2
	10 ~ 30	0.2
	30 ~ 50	0.3
	50 ~ 100	0.5

*FIG. 3*



**FIG. 4**



5 / 27

## *FIG. 5*

INPUT STANDARD SPECIFICATIONS

Dn =

Dg =

Lh =

## *FIG. 6*

### AUTOMATIC COMPUTING PROCESS OF DETAILED PORTIONS

$$D_{no} = D_n + (D_g - D_n)/4$$

$$D_{gi} = D_{gn} - (D_g - D_n)/4$$

•

•

•

## *FIG. 7*

### DRAUGHTING INFORMATION FORMATION

$$X1 = X0$$

$$Y1 = Y0 + Dg/2$$

$$X2 = X1 + Lh$$

$$Y2 = Y1$$

...

...

$$P1 = (X1, Y1)$$

$$P2 = (X2, Y2)$$

$$P3 = (X3, Y3)$$

...

...

Line (P1, P2, y)

Line (P2, P3, y)

Txt ("Φ", Dg, y, m)

Txt ("Φ", Dn, y, m)

Txt (" ", Lh, y, m)

## ***FIG. 8***

SELECTION OF DISPLAY

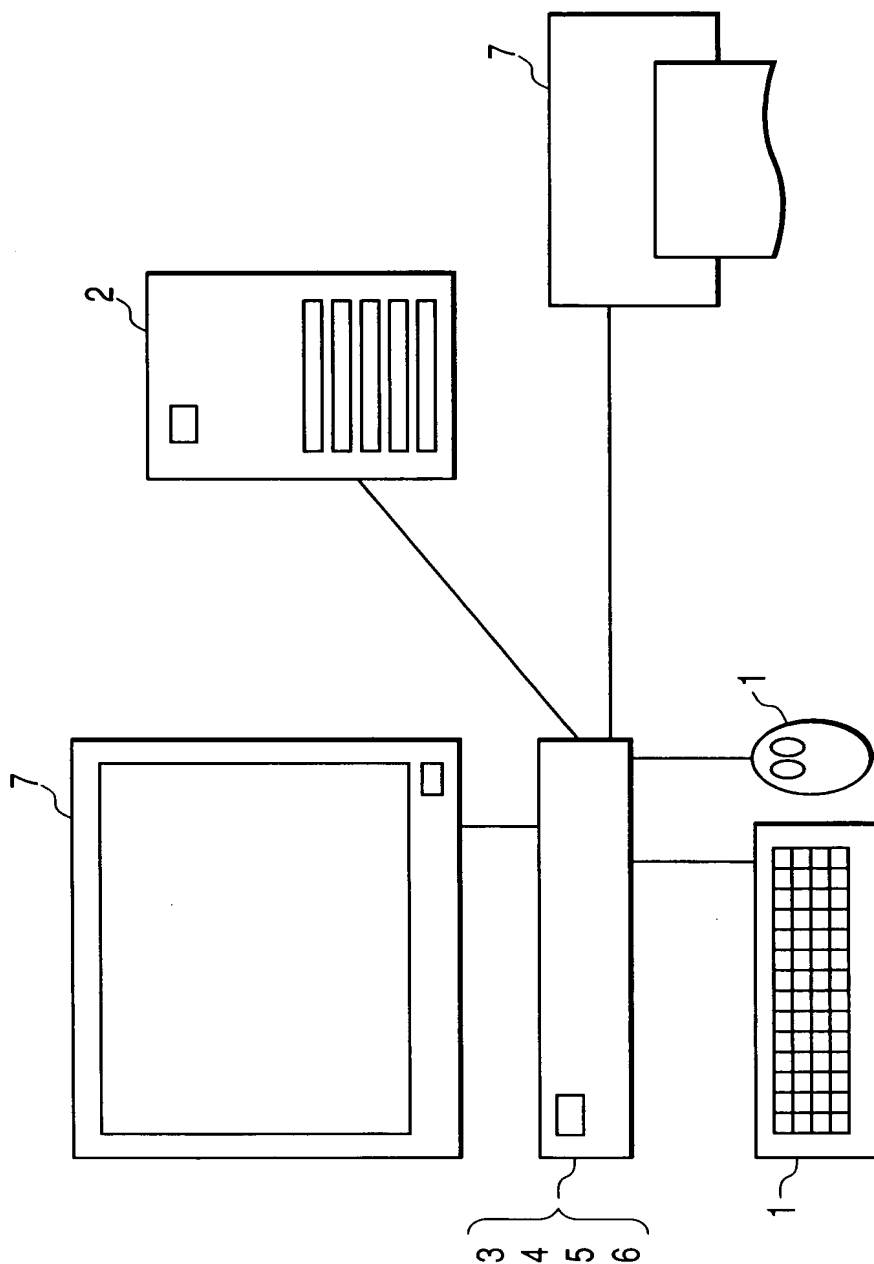
- ☐ STANDARD DISPLAY
- ☐ INPUT VALUE DISPLAY
- ☐ CHANGED PORTION DISPLAY
- ☐ INPUT & CHANGED PORTION DISPLAY

OK



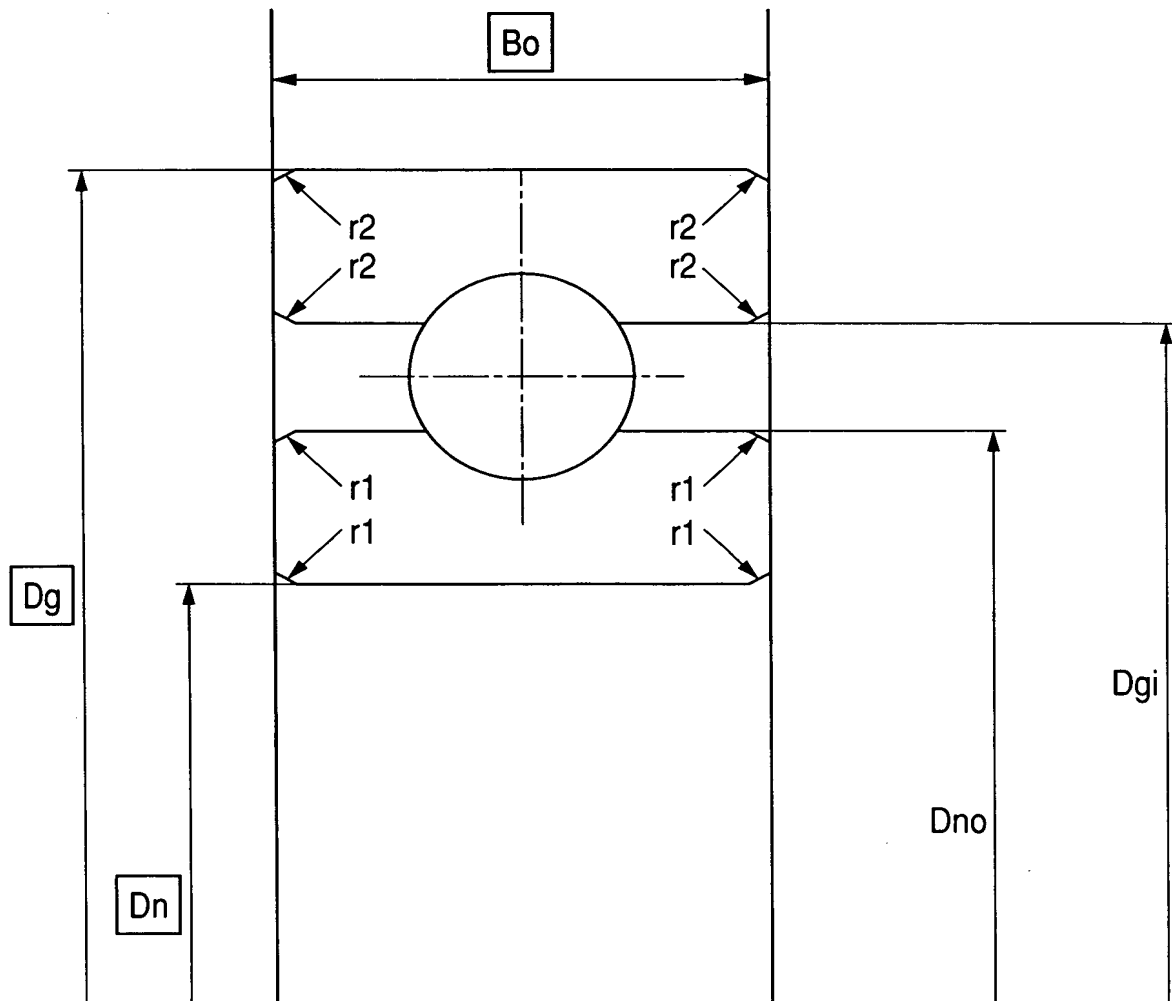
9 / 27

FIG. 9

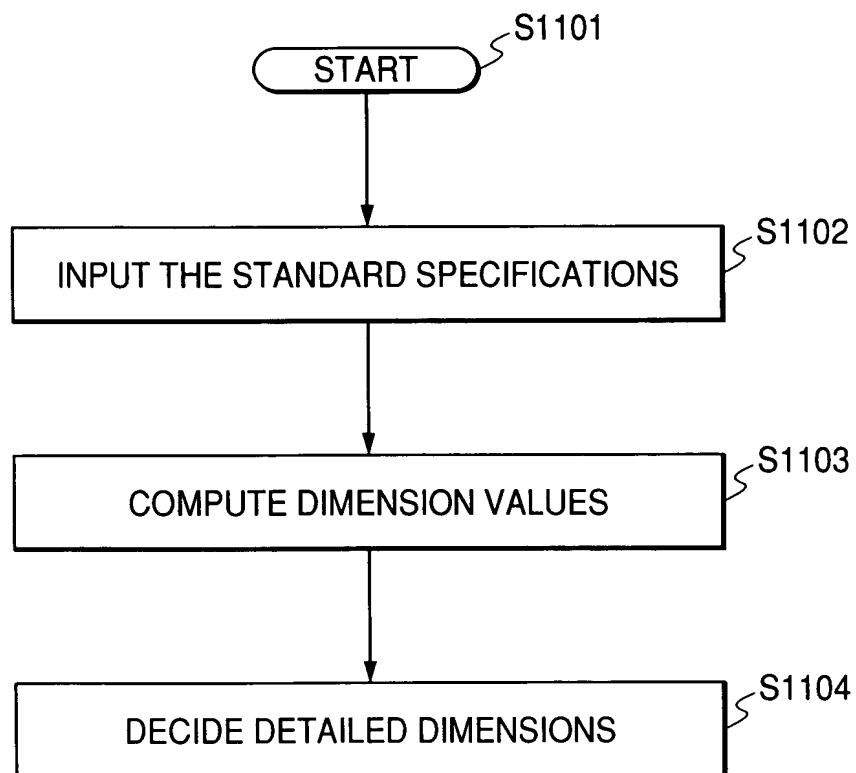


10/27

*FIG. 10*



**FIG. 11**



12 / 27

*FIG. 12*

INPUT STANDARD SPECIFICATIONS

Dn =

Dg =

Bo =

## *FIG. 13*

### AUTOMATIC COMPUTING PROCESS (1) OF DIMENSION VALUES

$$D_{no} = D_n + (D_g - D_n)/4$$

$$D_{gi} = D_{gn} - (D_g - D_n)/4$$

•  
•  
•

### AUTOMATIC COMPUTING PROCESS (2) OF DIMENSION VALUES

$$r_1 = 0.2$$

$$r_2 = 0.3$$

•  
•  
•

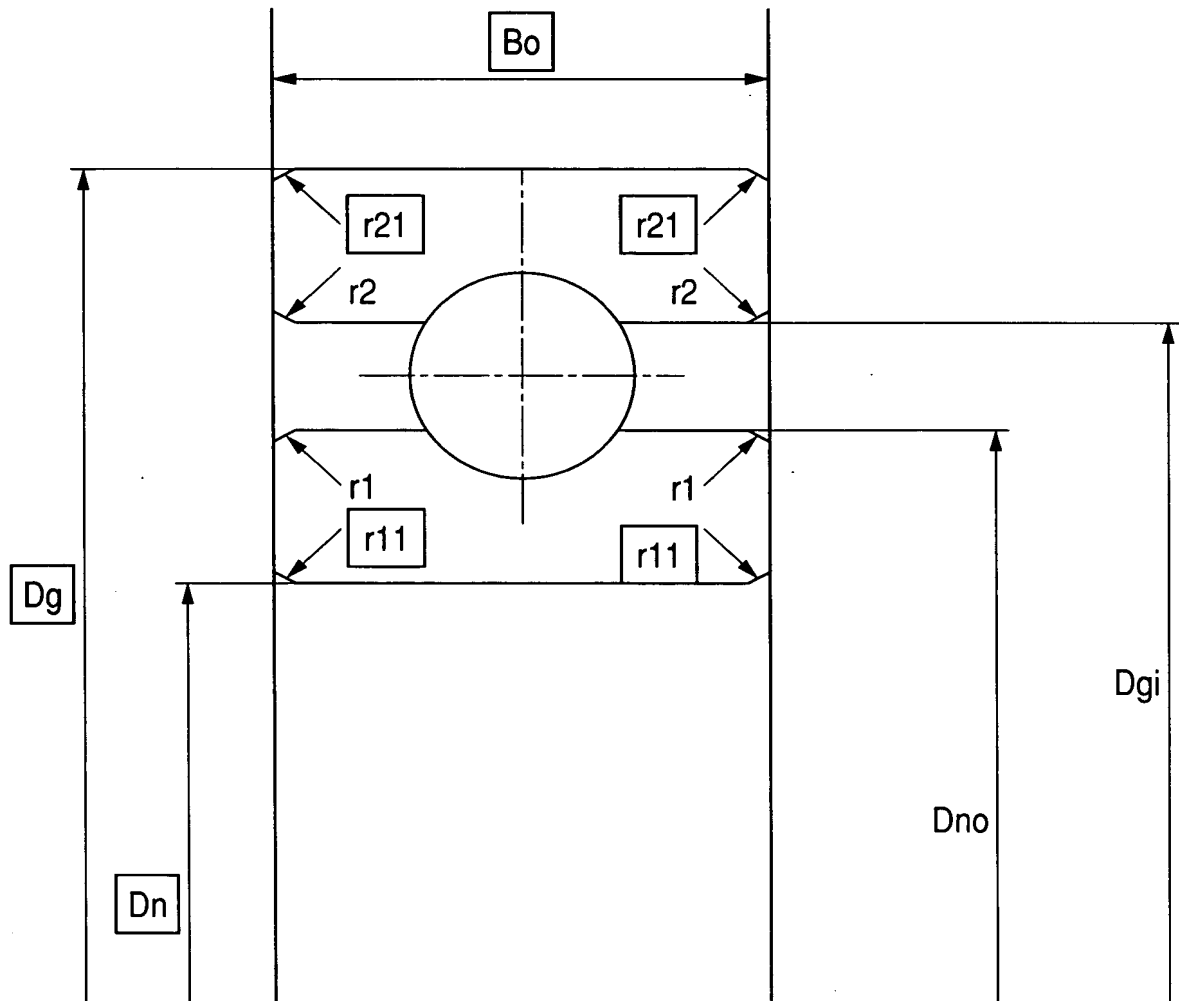
*FIG. 14*

The figure shows a graphical user interface (GUI) for a replacement sheet. It consists of a main rectangular frame. Inside this frame, there is a smaller rectangular area containing several input fields and labels. The input fields are arranged vertically on the left side of this inner area, each with a dotted border. The labels are positioned to the right of the input fields. At the bottom of the main frame, there are two rectangular buttons labeled 'OK' and 'NG'.

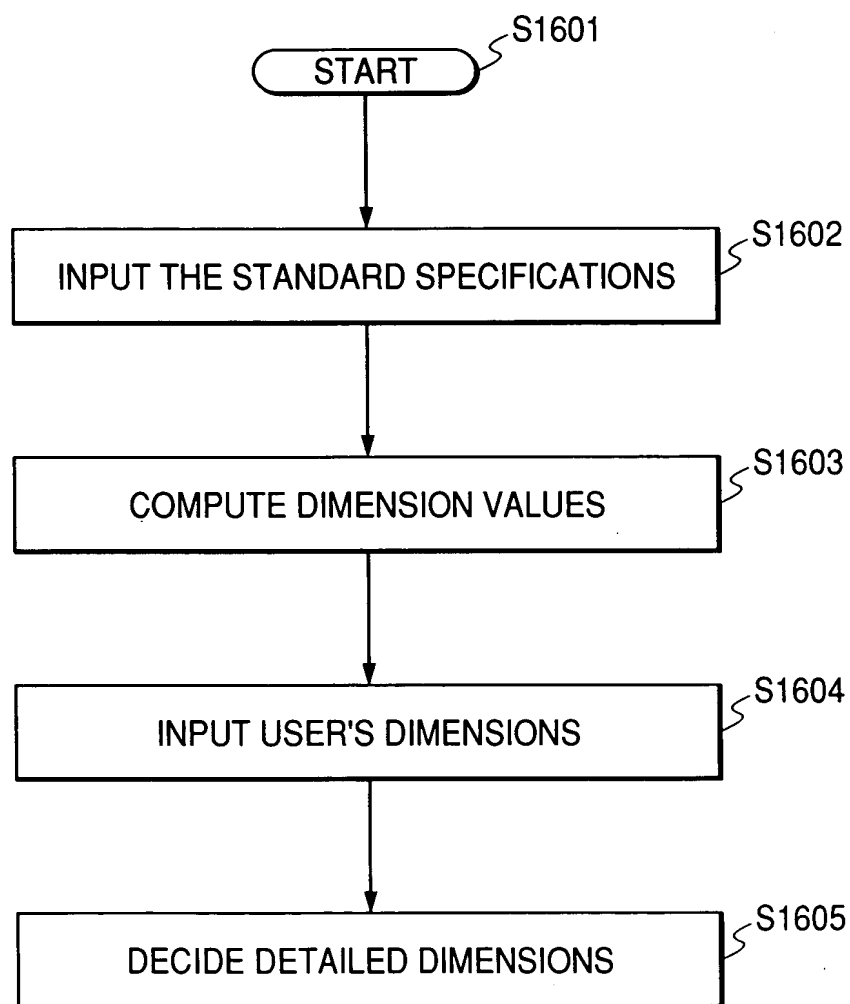
Dn = 10.0	
Dg = 50.0	
Bo = 10.0	
Dno = 20.0	
Dgi = 40.0	
r1 = 0.2	
r2 = 0.3	

OK NG

*FIG. 15*



**FIG. 16**





***FIG. 17***

INPUT USER'S DIMENSIONS

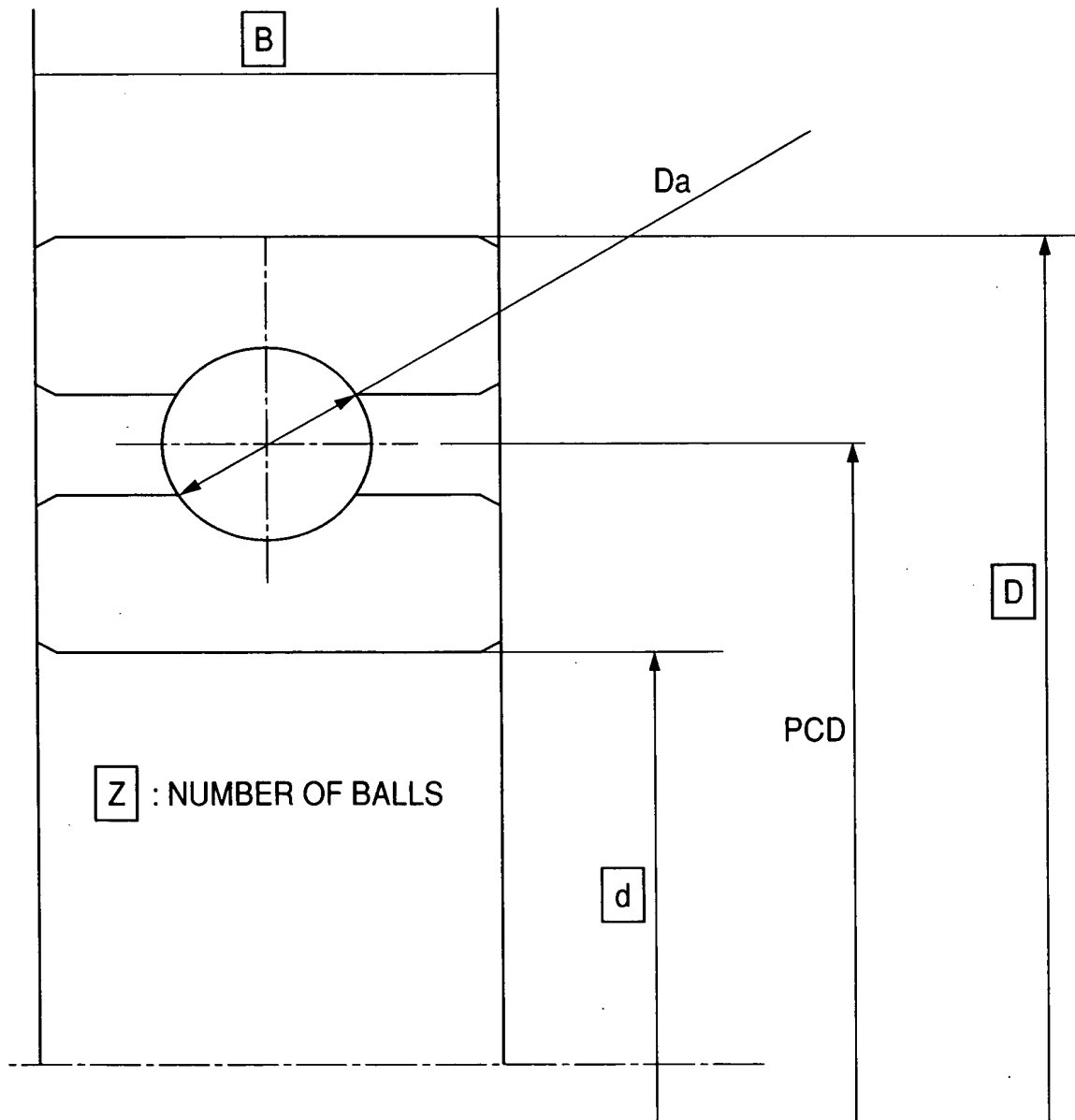
r11 =

r21 =

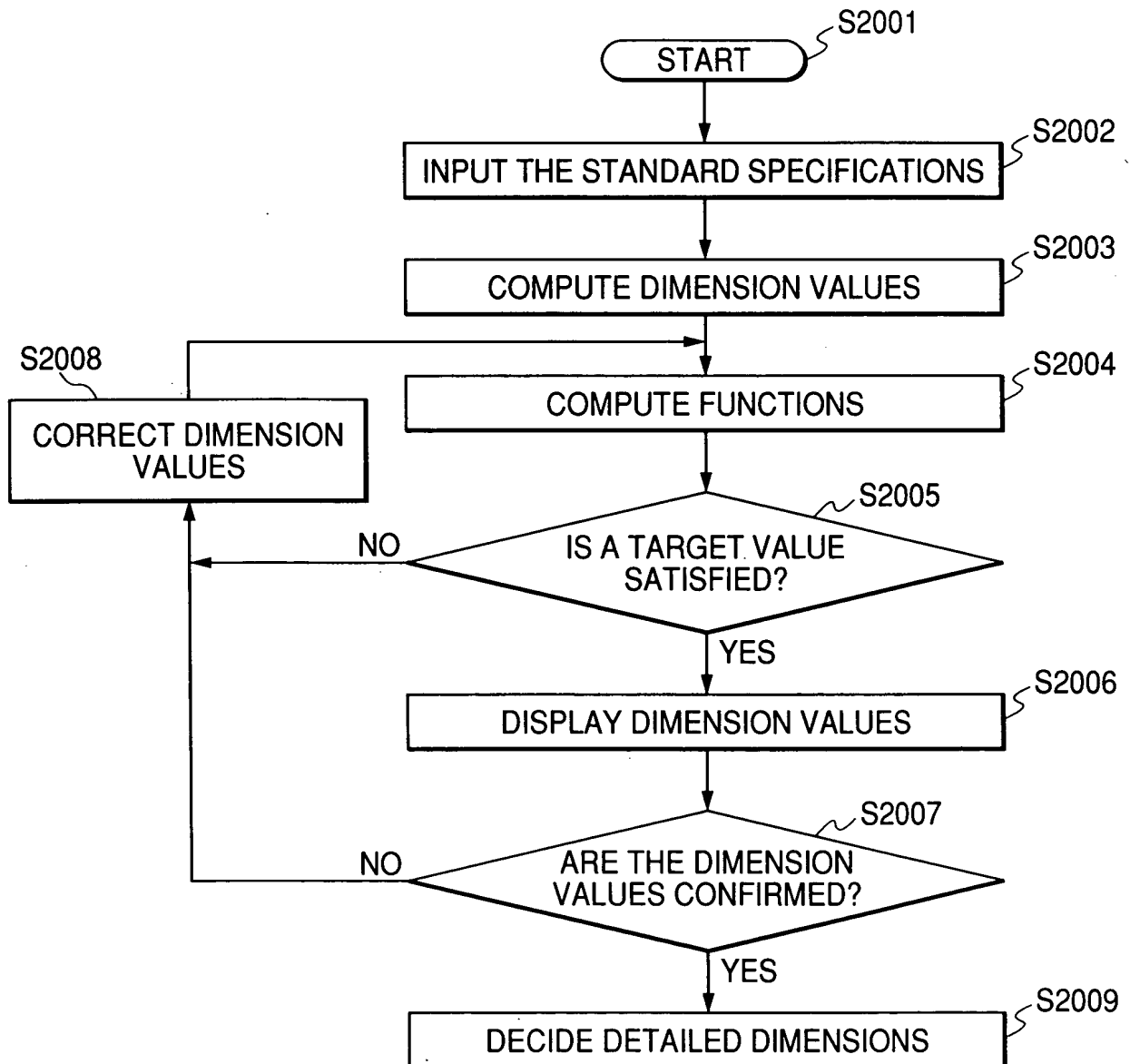
*FIG. 18*

<table border="1"><tr><td>Dn = 10.0</td></tr><tr><td>Dg = 50.0</td></tr><tr><td>Bo = 10.0</td></tr><tr><td>Dno = 20.0</td></tr><tr><td>Dgi = 40.0</td></tr><tr><td>r1 = 0.2</td></tr><tr><td>r2 = 0.3</td></tr><tr><td>r11 = XXX</td></tr><tr><td>r21 = XXX</td></tr></table>	Dn = 10.0	Dg = 50.0	Bo = 10.0	Dno = 20.0	Dgi = 40.0	r1 = 0.2	r2 = 0.3	r11 = XXX	r21 = XXX
Dn = 10.0									
Dg = 50.0									
Bo = 10.0									
Dno = 20.0									
Dgi = 40.0									
r1 = 0.2									
r2 = 0.3									
r11 = XXX									
r21 = XXX									
<table border="1"><tr><td>OK</td><td>NG</td></tr></table>	OK	NG							
OK	NG								

**FIG. 19**



**FIG. 20**



***FIG. 21***

INPUT THE STANDARD SPECIFICATIONS

D =

d =

B =

INPUT THE TARGETS

TARGET LIFETIME (L) =

h

NUMBER OF  
REVOLUTION (R) =

Min

LOAD (P) =

Kg

OK

## *FIG. 22*

### AUTOMATIC COMPUTING PROCESS OF DIMENSION VALUES

•

•

•

$$Da = 4.0$$

$$PCD = 31.0$$

$$Z = 14$$

•

•

•

## *FIG. 23*

### LIFETIME COMPUTING PROCESS

$$C = f(\dots, \text{PCD}, Z, \text{Da} \dots)$$

$$L = (C/P)^3$$

(10<sup>6</sup> rev)

$$L_h = L/(R * 60)$$

(h) min<sup>-1</sup>

## *FIG. 24*

### TARGET VALUE CONFIRMING PROCESS

IF  $L_h < L$ (

NG : COMPUTE AGAIN AFTER THE DIMENSIONS ARE CHANGED

)

•

•

•



*FIG. 25*

CONFIRM DIMENSION VALUES	
D = 30.0	STANDARD SPECIFICATION
d = 18.0	STANDARD SPECIFICATION
B = 10.0	STANDARD SPECIFICATION
Da = 4.0	COMPUTED VALUE
PCD = 31.0	COMPUTED VALUE
<div style="border: 1px dotted black; padding: 2px; display: inline-block;">Z = 14 MANUAL INPUT</div>	
<div style="display: flex; justify-content: space-around; margin-top: 10px;"><div style="border: 1px solid black; padding: 5px 20px;">OK</div><div style="border: 1px solid black; padding: 5px 20px;">NG</div></div>	

***FIG. 26***

CORRECT DIMENSIONS

Z =

Da =

27 / 27

*FIG. 27*

D = 30.0

d = 18.0

B = 10.0

Da = 4.0

PCD = 31.0

Z = 15

OK

NG